User's Guide

RavTrack PC

Real-time GPS Tracking Software

PC Compatible Version 1.2

Disclaimers

Trademarks

Statement of Conditions

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Documentation Conventions

General

This manual uses the following conventions to present information:

Convention (TypeFace)	Description
bold italic	Menu commands and button names
bold italic sans serif	Web GUI page links
`terminal`	Computer display text
`bold terminal`	User-entered text
Italic	Italic type indicates the titles.

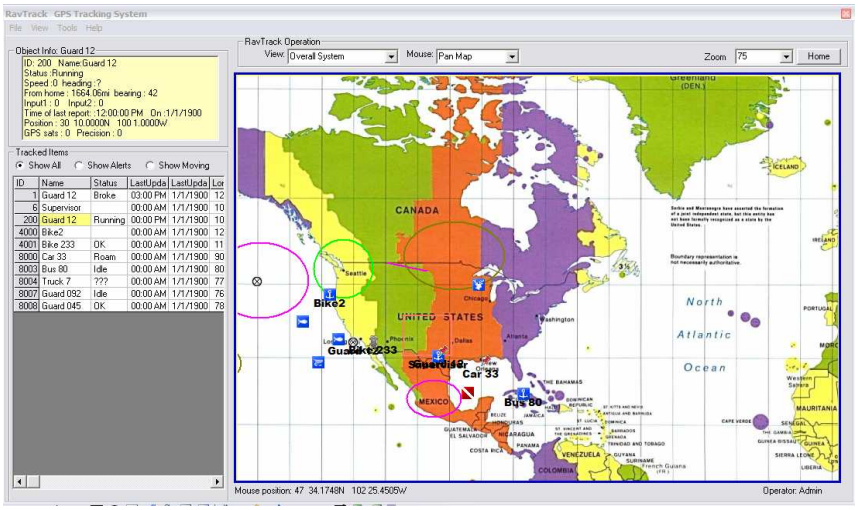
Icon	Description
	Requests that you pay particular attention to a specified procedure or piece of information in the text. The NOTE message has a regular type style.
	Information shown here describes a difference between the Limited version of the program and the Full version of the program. .
	**CAUTION Icon: Suggest you review the referenced details and heed the instructions offered. The CAUTION message has a bold type style.**
	***WARNING Icon: Demands that you observe the actions given in the text. The WARNING message has a bold italic type style.***
	COMPASS Icon: Points the user to additional information concerning the topic under discussion. The COMPASS message has a regular type style.

Overview of Major Capabilities

Section1

General

RavTrack™ PC by Raveon is a PC software application for displaying, tracking, alarming, and logging the activity of RavTrack Transponders.



This easy-to use PC application graphically shows the location and status of cars, trucks, people, or anything equipped with RavTrack Transponders. The displayed map may be any graphic image, bitmap, or .jpg.

RavTrack PC Features:

The features below are what make a RavTrack PC the right choice for real-time tracking:

1) ***Real-time***. Position and status updates are available as quickly as every second. The installer may configure the system report interval, to whatever update interval he wishes, trading off latency of reporting for power-consumption and number-of-assists tracked.

2) ***Simple***. A single PC is all that is required. No server, no Internet, no cellular carrier is needed. The map on the display may be any graphics image.
One-click on an icon, and the user can see complete vehicle status including location, distance, heading, speed, I/O status, temperature, voltage, and radio signal strength.

3) ***Custom Alerts***. The program may be configured to alert the operator when certain events occur. Operator alerts are triggered by various transponder-specific events such as speeding, proximity to Points of Interest, Geo-fence violations, idling, and digital input status.

4) ***Database Driven***. The information on all units being tracked is stored in a MS Access database. All movements and events are logged in a

separate MS Access database. Users may create custom reports using Access or other SQL tools interfacing with the data in real-time.

5) ***Log Replay*** The user may select log entries to replay onto the map, to show the past location and status information. *RavTrack PC*'s smart dots show the past location of tracked objects, and include status information as well (speed, heading, voltage, temperature…)

6) ***UHF Licensed Radio Channels***. RavTrack Transponders utilized licensed UHF radio channels. Unlike spread-spectrum system, the operator owns the right to use the channel. And UHF radio channels have 10X or more the communication range of unlicensed spread-spectrum radios. Raveon will assist any RavTrack customer with obtaining the FCC license for his channel. *RavTrack PC* will allow up to 6 radios to be connected to one PC, so up to 6 different RF channels may be utilized in the same area, or linked in via remote sites.

7) ***Low Cost Transponders***. The highly integrated StingRay GX Transponder has a radio, modem, and GPS in one assembly. The per-unit cost is lower than any other UHF AVL product on the market. It is simple-to-use, so the cost in installation is very low. There is no cost for a wireless carrier or satellite provider.

8) ***Secure***. All position transmissions are encrypted, so that only radios with the same pass-key code can communicate.
The RavTrack PC program is also administrator-rights protected, allowing a view-only user mode, and total-control for the administrator.

9) ***Advanced Features***. Advanced features are configured when the Transponder is installed. The RavTrack Transponders have alarm inputs, and status output pins for specialized applications.
All RavTrack Transponders have the ability to send time, temperature, voltage, altitude, I/O status, alarms, satellite signal quality, and radio signal quality in each transmission, so the system operator has enormous visibility on the status and location of his tracked objects.

10) ***Advanced Reporting.*** All tracking data, object data, alert data, and logs are stored in Microsoft Access data bases. Access provides powerful reporting capabilities, SQL language support, and an industry-standard platform to analyze and report on system operation.

Databases

RavTrackObjects.mdb

The RavTrackObjects.mdb database holds configuration information about the RavTrack system. It has 3 tables in it:

ObjectData	Records for each tracked object. Any object such as a car, bike, truck, that has a GPS radio transponder on it will have an entry in this table, which maintains the current

information about the object (location, speed, heading…) as well as a user-friendly name.

FenceDatabase The records in this table hold information about the geofences that have been established, as will as points of interest.

Alarm Rules As the table name implies, each entry in this table holds an individual alarm/alert rule. Alarm/alert rules specify the conditions that trigger alerts as well as the action to take if an alert is triggered. The rules processor in the RavTrack PC monitors the objects and verifies every position report against these rules, and generates alerts based upon the rules.

RavTrackActivity.mdb

The RavTrackactivity.mdb database holds the activity log for the RavTrack system. It has one table in it, the activity log:

Log Records for each position/status received by the RavTrack PC program. The RavTrack PC program may be configured to store every reception in the log, store only data from moving objects in the log, or store nothing in the log.

RavTrack PC Versions

Information shown here describes a difference between the Trial, Limited and the Pro versions of the program. The software activation key determines the level of functionality. The table below outlines the differences between the various versions of the RavTrack PC.

Version	Maximum number of tracked objects	Number of communication channels	Maximum number of rules
Trial	2	1	1
Limited	10	1	4
Pro	unlimited	6	Unlimited

Legal Notice

GPS tracking may be illegal in certain states and in certain circumstances. Our tracking devices may not be used to violate the privacy rights of others, or in violation of local, county, state or federal statutes. In no way will Raveon Technologies Corporation, dealers or partners be held responsible for inappropriate use of these products.

IT IS THE SOLE RESPONSIBILITY OF THE BUYER TO CONSULT LEGAL COUNSEL FOR THE INTERPRETATION OF ANY LAWS APPLICABLE TO THE AREA OF INTENDED USE OF THESE PRODUCTS.

Recommended System requirements

Desktops

Pentium P4 Dual 2.6GHz processor
1GB RAM
5GB free hard disk space
128MB graphics card (NVidia, Matrox or ATI recommended), UXGA (1600x1200) resolution display
CD-RW combo drive
19-inch CRT screens, resolution 1600x1200
Windows XP Home or XP Professional

Laptops

Pentium M 1.7GHz processor
1GB RAM
5GB free hard disk
64MB graphics card (ATI or NVidia recommended), UXGA (1600x1200) resolution
CD-RW combo drive
15-inch TFT internal screen plus 19-inch external display
Windows XP Home or XP Professional

Installation Steps

1. Visit www.ravtrack.com and go to the “Downloads” section of the website.
2. Log into the website. If you are a new user, create a user account.
3. Click on the RavTrack PC software program link to download it to your computer.
4. A ZIP file containing an executable program called *RavTrackPC Ver x-x.exe* will download to your computer.
5. Once the download is complete, open the .ZIP file and double-click on the file *RavTrackPC Ver x-x.exe* contained in the .ZIP file.
6. Run the downloaded .exe file, and follow the setup instructions.
7. RavTrack PC is now installed on the computer. Proceed with the first-time setup instructions.

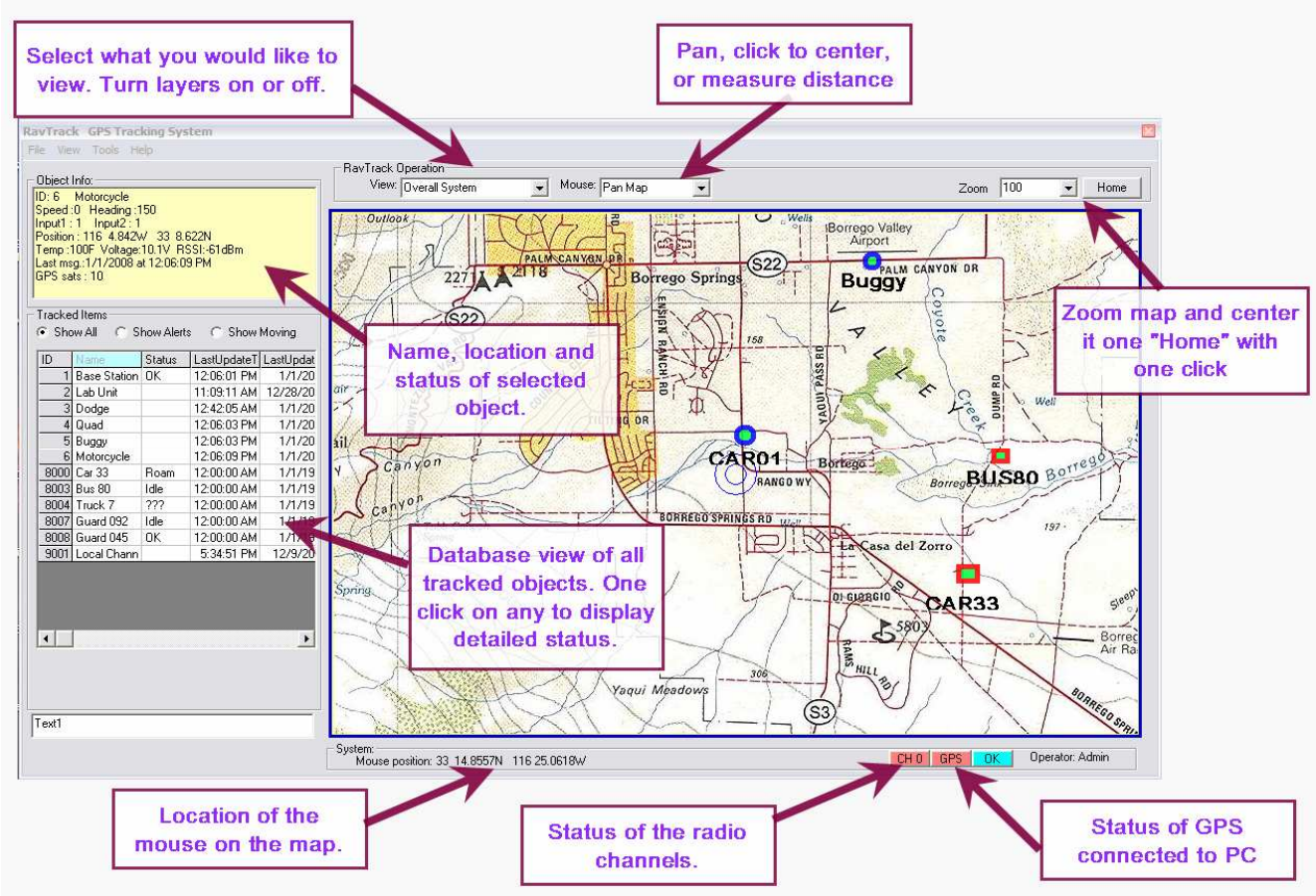
First-Time Setup

Once the RavTrack PC software is loaded on the computer, you must configure a number of settings and add your tracked objects to the database.

Begin by running the RavTrack PC application. Select ***Start*** and then ***RavTrack PC by Raveon Technologies***, and then ***RavTrack***.

This will start-up the RavTrack PC software. You may see an error concerning the communications port settings. You may ignore this error message, as the communications will be the first part of the program to configure.

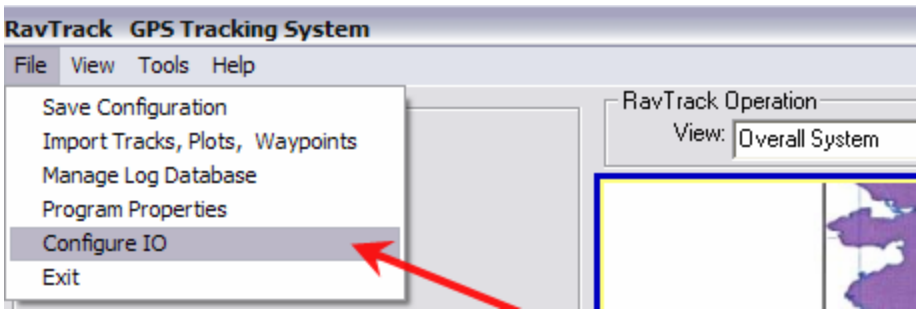
RavTrack PC Main Screen Overview



This is the main user-window for the *RavTrack PC* software program. You will note in the lower-right corner are buttons showing the status of the communications from the radio and GPS. When they show red, there is a problem with the radio communications set-up.

Configure your Communications settings

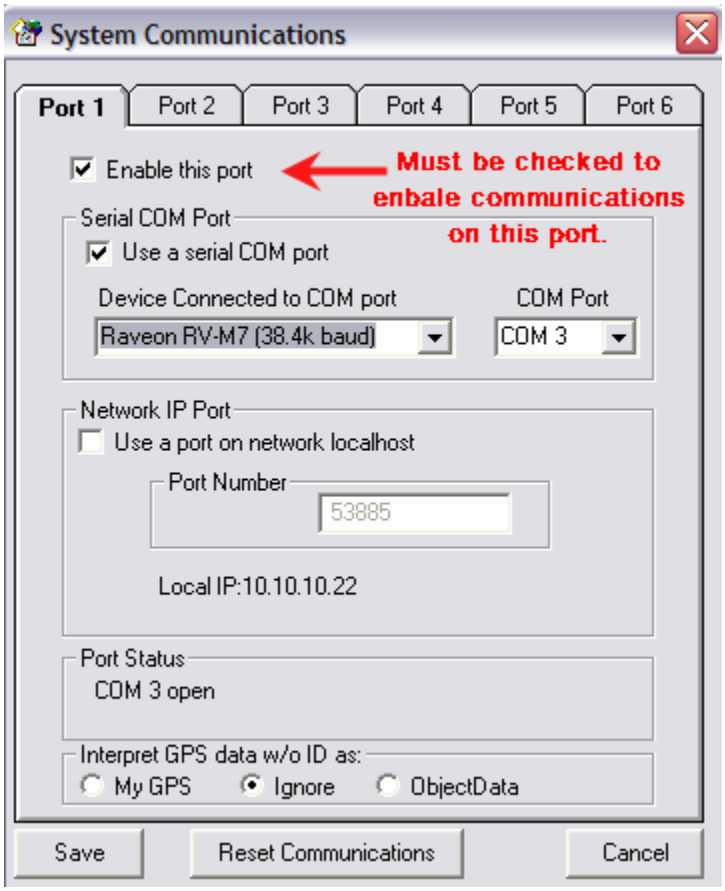
From the main screen, select ***File*** and ***Configure IO*** as shown below.



This will bring up the configuration tabs for the communication ports. The RavTrack PC program has 6 communication "Ports". The 6 ports are used to specify up to 6 different COM ports on the computer that may be used for communications with a RavTrack radio transceiver.

L/F

The Limited version of the RavTrack PC only allows data communications using ***Port 1***. The Full version allows up to 6 simultaneous data ports to be used.



Make sure the "***Enable this port*** item is checked. If it is unchecked, the software will ignore this port.

Current versions of the RavTrack PC only support RS-232 serial communications. Future version may support data exchange using UDP packets from an IP network.

Check the ***Use a serial COM port***, and then select the ***COM Port*** port number that is connected to the RV-M7 transceiver. Note: In the pull-down list of COM ports, the ports listed in CAPITOL letters are the ports that the software has detected are present on the computer. They may or may not be available to use, but they are present.

In the pull-down menu labeled “Device Connected to COM port”, select ***Raveon RV-M7 (38.4K baud)***

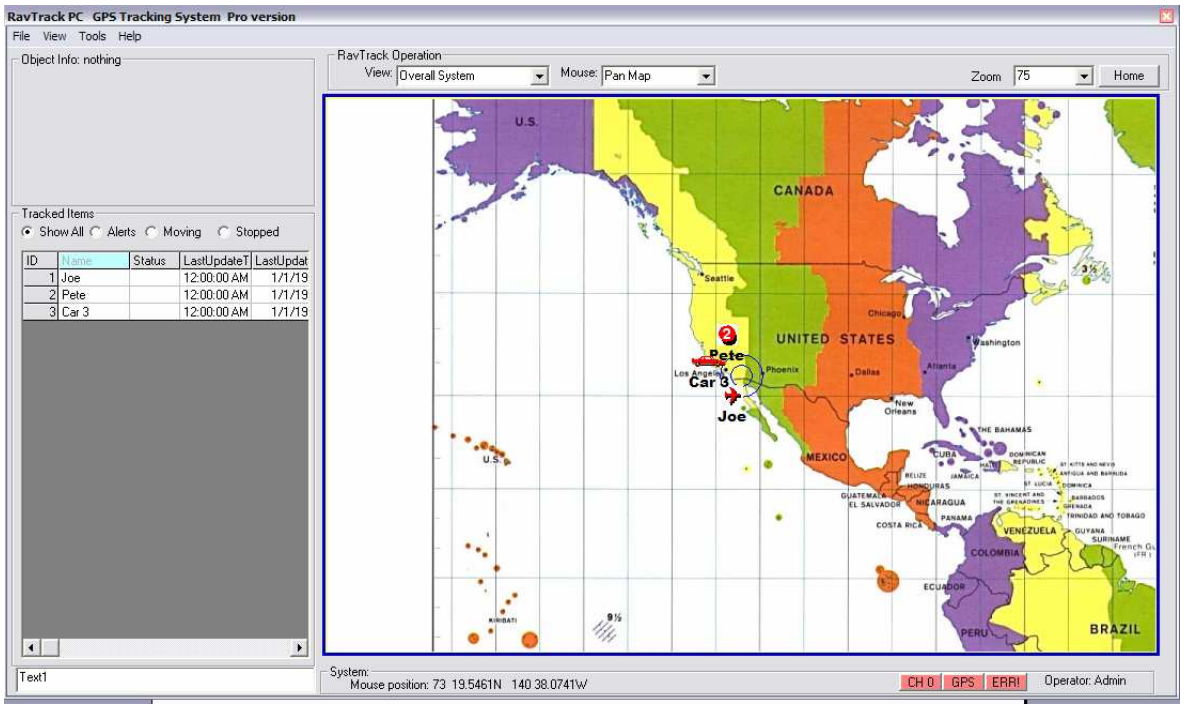
Select ***Save*** to save the settings to the Ravtrack.ini file.

There is a button called ***Reset Communications*** on the bottom of the form. At any time, this may be clicked, and the RavTrack PC software will close the selected COM port, and then re-open it. Certain computers have difficulty with COM port communications. If the correct port was selected, and communications is not working, then click these button to try to reset the port. It may also be necessary to click this if the computer hibernated while the program was running as certain computers do not turn the COM ports back on when they return from hibernation.

Main Screen Operation

Section3

The main screen for the factory default configuration will look similar to the picture below. RavTrack PC is shipped with a default world-map and 3 entries in the object database. All items that are tracked by the RavTrack PC are referred to as “objects”. Typically these are cars, trucks, people, but to be general, throughout this manual, “objects” refer the things being tracked.

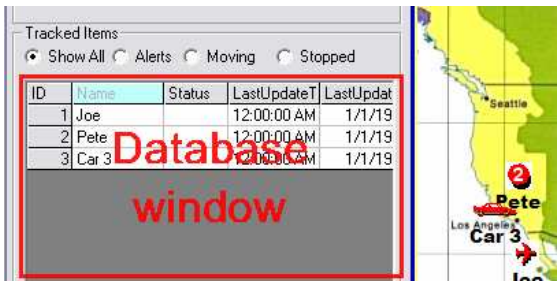


There are two primary functions of the main screen:

1. Display a map and on it, display the location of the tracked objects.
2. Display status and information for tracked objects.

Database Window

On the left side of the screen is the database window. This window show the data for each tracked object.

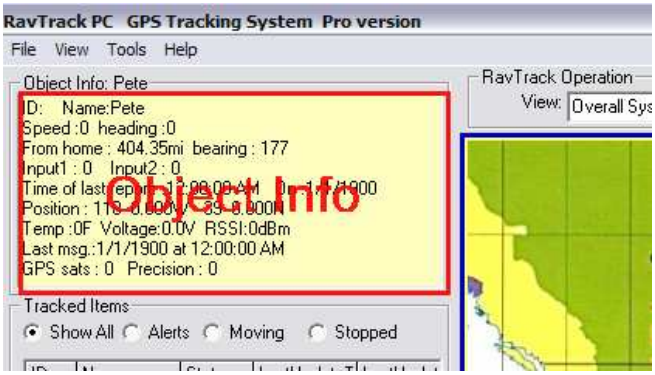


If the "***Show All***" button over the window is selected, then the window is displaying every object in the *Objectdata* database.

There are 4 buttons over the database window, and these can be used to filter-out records, and display only a subset of the objects. Filters are provided for showing moving objects, stopped objects, and objects triggering alerts.

Object Info Window

Above the Database window is the "*Object Info*" window.

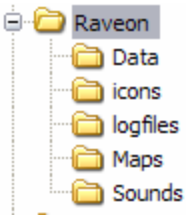


This window of texts lists status and location information about a selected object. To select and object to display its information, double-click on the object in the database window, or left-click on its icon on the map.

This window can also be used to identify geo-fences and points-of-interest on the map by left-clicking on them.

Map

The map shown on the main-screen may be the stock world map shipped with the RavTrack PC software, or a custom-map. You may create your own custom map by using the built-in map calibration tools, or contact Raveon for assistance with creating a map for your particular application. Any graphic file may be converted to a RavTrack map file.



Maps are stored in a \Maps sub-directory under the same directory that the RavTrack PC software resides in. All maps used by the RavTrack PC program must be stored in the \Maps sub-directory after they have been calibrated.

The on-screen map has a number of "Layers". These layers are like transparent sheets stacked up, each having different type of information drawn on them. The operator may turn various layers on or off to help clarify the current location and status of the tracked objects.

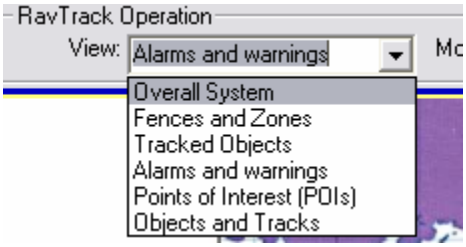
If the center of the screen is not on the map, the user may select ***View, Go to map*** from the main window. This will center put the map window at the upper-right corner of the map.

Layers

The layers can be enabled or disabled, so that the map displays only the desired information. The standard layers with *RavTrack PC* are:

Object Layer	This is the layer on the map that the icons for all tracked objects are placed.
Fence Layer	This is the layer that "geofences" are drawn on. When a shape is drawn on this layer, it is assigned a name, and may be used by the rules processor to check if objects are inside the shape or not.
Graphics Layer	The user may draw shapes or place icons on this layer to add graphics to the map.
POI Layer	Points of Interest are named icons that the user may place on the map. The points may be used by the rules processor to generate operator alerts.
Alarms Layer	When the rules processor detects a rule has been met, it places an icon on this layer to identify the location of the object which triggered the rule alert.

The operator may select various layers to be displayed or hidden by clicking on the ***View*** drop-down menu. The first selection is ***Overall System***, and if selected, displays all layers.

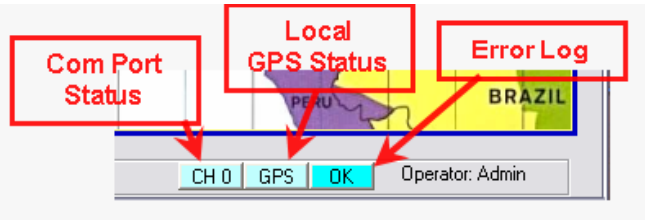


On Screen Information

RavTrack PC is rich with on-screen information to make using it more informative. The user can easily see the geographic position of the mouse, the status of the radio communications, the status of any local GPS receivers, and various map display options such as the zoom level and visible layers.

Communication Status

To assist in monitoring the status of the communication port, or the diagnose problems with communications, a number of status buttons are located in the lower-right corner of the screen.



The color of all three buttons indicate their current status. Blue means that everything is OK, yellow mean possible problem, and red means a serious problem exists.

The ***Com Port Status*** button is blue when the communications port is working and receiving valid data. It will quickly blink darker blue at the moment it receives a valid position/status message from the connected device. If data stops coming into

the port, it will turn yellow, and then later red if it appears all data has stopped coming into the port.

The operator may double-click on this button to bring up a window that will display the list of communication ports, and their individual status.

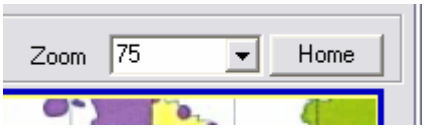
The ***Local GPS Status*** button is blue when valid NMEA position messages are received into any of the 6 communication ports. RavTrack PC can accept the standard NMEA $GPGGA and $GPGLL messages into any of the 6 Communication Ports. When either of these messages is received with a valid position message, the Local GPS Status button is turned blue. If after a long time, no valid NMEA position message is received, then the ***Local GPS Status*** button turns yellow, and then later red indicating the local GPS may have failed or lost satellite visibility. The operator may double-click on this button to bring up a window that will display the list of communication ports, and their individual status.

Note that for the RavTrack PC to obtain a position fix using local GPS, the *My GPS* option in the "*Interpret GPS data w/o ID as:*" must be selected on at least on Communications Port in the *Configure IO* menu. When this option is checked, any valid NMEA messages on this port will be interpreted as a local GPS position fix. The local position fix may be used to center the map.

The ***Error Log*** button is blue if there are no system errors, and turns red if there are system errors. Clicking on this button will bring up the error log so that the operator can investigate the cause of the error.

Zooming and Home

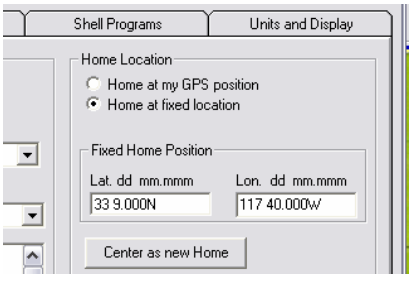
In the upper right of the main screen is a zoom drop-down menu the operator may use to zoom in or out on the map. The zoom value is in percent.



Alternately, the ***Page Up*** and ***Page Down*** keys on the keyboard may be pressed, and the map will zoom in/out appropriately.

Hint: If the map appears blank, zoom back (10% or smaller) until the map image appears in the map window of the main screen.

The RavTrack PC keeps track of a "HOME" position. HOME may be used for centering the map or referenced by the rules processor. For example, a rule may be configured to alert the operator if an object is too far from the HOME position. Or, the RavTrack PC may be configured to automatically keep the map centered on the HOME position.



Home may be either a fixed location, manually entered by the operator, or it may be the current

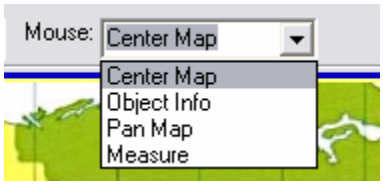
position as reported by a local GPS receiver connected to a Communications Port. This may be configured on the ***Program Operation*** tab of the ***Program Properties form*** as shown on the right.

The Raveon RV-M7 series of GPS transponders will output NMEA position messages mimicking the messages from a standard GPS as well as $PRAVE position/status messages from other transceivers, so that a local GPS is often not needed.

Mouse Operation

The current position of the mouse pointer is shown and the bottom of the screen. The position is shown in the dd mm.mmmm format, where dd is the degrees, and mm.mmmm is the decimal minutes.

The way the mouse interacts with the map may be changed by the operator. The operation of the mouse may be selected in the ***Mouse***: drop-down list on the top of the main window.

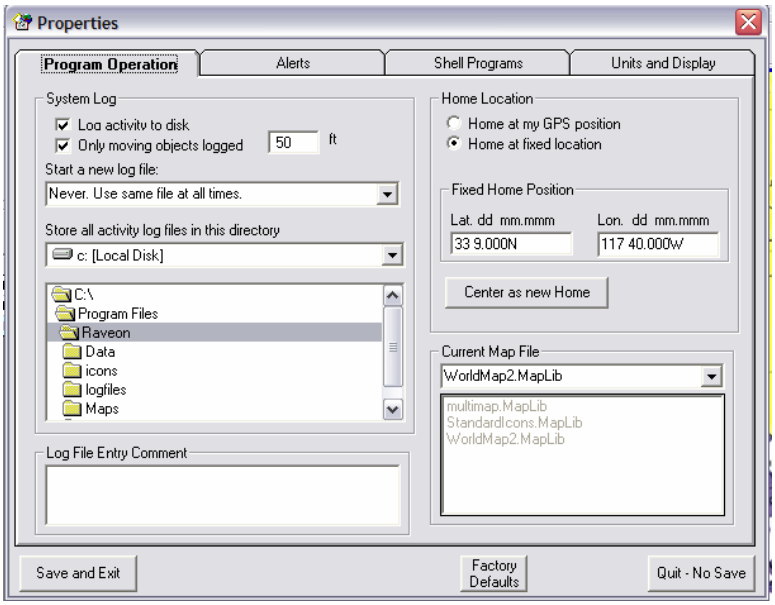


Center Map	causes the map to center on any position that the user clicks on.
Object info	is used to click on tracked objects, and then display their position/status.
Pan Map	is the default mode, and allows the operator to click on the map, and pan its position (as long as “Center on my GPS position” is not enabled)
Measure	brings up a distance measuring tool to make calculating distances easier.

Program Configuration

Section4

To configure the various options within the RavTrack PC program, select ***File***, and then ***Program Properties***. This will bring up a form with 4 tabs.



The operator must be logged in as an Administrator to change the configuration of the RavTrack PC. To log in as an administrator, select ***Tools, Login*** and enter the administrator password. To log out, and thus disabling administrator privileges, select ***Tools, Login*** and ***Logout***.

The default password is "***admin***", all lower-case letters. To change the password, enter the current password in the ***Password*** text field, check the ***Change Password*** box, and enter the new password into the required text boxes. Then click ***OK***.

- Passwords are case sensitive. ***admin*** and ***ADMIN*** are not the same password. On the lower-right corner of the main RavTrack PC window, the current user type is shown (admin or user). Users may not re-configure the program. Administrators may have full privileges to change settings.

The only exceptions to the Administrator privileges limitation is the map file selection. Any user may change the current map without being logged in as Administrator.

When an administrator logs in or out of the program, the RavTrack PC keeps the user logged in with the same privileges even if the program is stopped and re-started.

System Log Database

On the ***Program Operation*** tab, the user may enable the System Log. The System Log is a database that holds position and status information about the objects that have reported. Select ***Log activity to disk*** to enable saving position/status reports to the log database file.

On busy systems, the log database may grow quite large, so there is an option to limit the logging of position/status report from object to only those from moving objects. Click on ***Only moving objects logged*** and enter the distance they must move if only position/status information about moving objects is to be saved to the log.

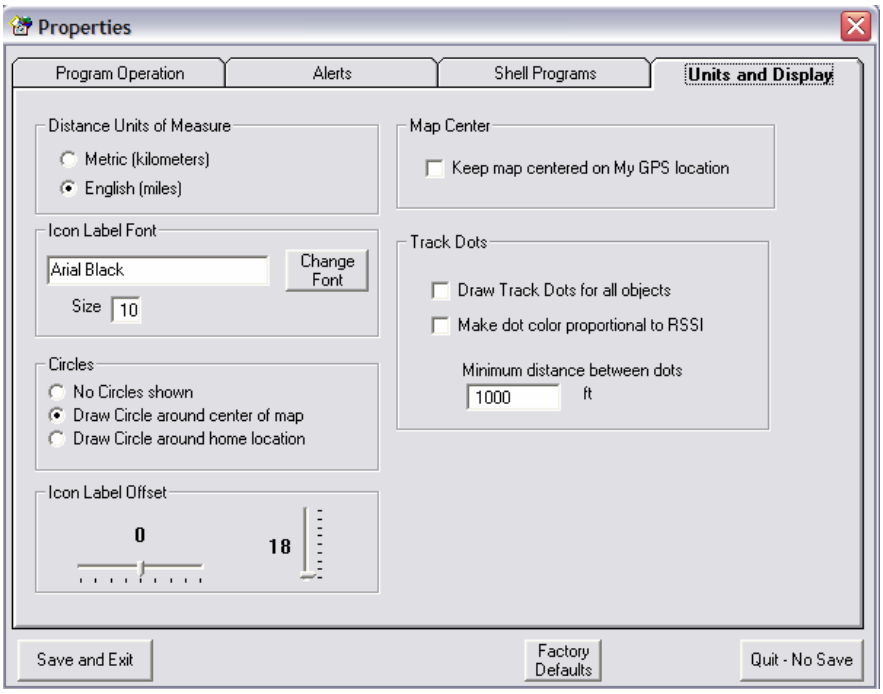
Ignore the ***Store a new log file:*** and ***Store all activity in this directory:*** drop-down menus.

Current Map File

The user may easily switch between maps using the ***Current Map File*** drop-down list. All .maplib type files that are stored in the /maps subdirectory are listed in the drop-down box.

Units and Display Options

The Units and Display tab allow the operator to select how some aspects of the RavTrack PC display information.



Metric or English Units

The program can display speed and distance in either Metric or English format. Log entries in the Log database as well as status entries in the tracked objects database are stored using the selected format.

Use caution when changing the units or measure and later analyzing the data. If the system of measurement was set to one type and then data was stored in the database, when it is changed to another format, the databases still hold the old data in the old units of measure, and thus data recalled from them may be displayed incorrectly. For example, if the program is set to metric, and an object was recorded going 100km/hour, the speed is saved in the log as 100. This simplifies the reporting for anyone using the log file, as the unit of measurement in the log are the same as set in the program. But if the program is later changed to English units and the log file is retrieved, it will show the speed as 100 *miles per hour* for the previous entry.

Icon Font

Use the ***Icon Label Font*** drop-down list to choose the font and font size when labeling object Icons on the map.

Circles

To put a set of circles on the center of the map, select ***Draw Circles around center of map***. TO put them around the HOME location, select ***Draw Circles around home location***.

Track Dots

Track dots are a powerful way of showing where tracked objects have gone. The RavTrack PC has a limited number of track-dot memories. If Track Dots are enabled, position/status reports are stored along with a dot placed on the map at the location of the object.

To make the color of the dot proportional to the radio signal strength, select ***Make Dot color proportional to RSSI***. The dot colors correspond to the following signal levels:

● - **Violet**	0 to -40dBm
● - **Light Violet**	-40 to -50dBm
● - **Dark Blue**	-50 to -60dBm
● - **Light Blue**	-60 to -70dBm
● - **Green**	-70 to -80dBm
● - **Yellow**	-80 to -90dBm
● - **Orange**	-90 to -100dBm
● - **Red**	-100 to -110dBm
● - **Dark Red**	-110 to -120dBm

Left click the mouse on any dot on the screen, and the Object Info box will display the ID, Name, and status of the object that cause the dot to be placed.

RavTrack PC has a 4000 dot memory, and once the 4000 dots are placed, they oldest one is re-used for new receptions, and the previous information stored in the dot is erased. This does not effect the log database file. It retains all position reports in it, and erasing a dot does not erase the database entry in the log.

Program Operation

Section 5

Special Keys

F2 = Center map on selected object, and draw circles
F3 = Draw circles around selected object to locate it
F4 = Center map on HOME location
F5 = Toggle range circles on/off
F9 = Clear the alert flag for the selected tracked object
[ctrl] F9 = Clear all alert flags for ALL tracked objects
ESC = Close the window
PageUp = Zoom in on the map
PageDown = Zoom out on the map

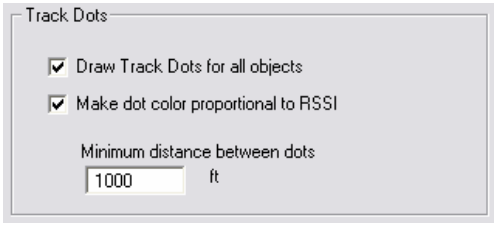
Mouse Operation:

Left Click Put mouse over any object on the map, and left click to display information about that object. The information will appear in the Object Info window of the main window.

Right Click Single right click on an object in the database window to see information on that object. Double click on an object in the database window to bring up a form to view its status and edit its name.

Track Dots

To enable track dots (snail trail of dots behind moving objects), select ***File, Program Properties***, from the main window.



On the Units and Display, tab, enable the Draw Track Dots for all objects checkbox. Also check the ***Make dot color proportional to RSSI*** if you wish the dot color to change with radio signal strength. Note, the Radio Signal Strength (RSSI) displayed by RavTrack PC is the strength received at the radio connected to the computer running RavTrack PC. If a repeater is used in the system, the RSSI reported will be that of the repeaters signal strength when the tracked object reporting is using the repeater to send messages to the RavTrack PC.

Set the ***Minimum distance between dots*** to any value you would like. There is a 4000 dot limit to the RavTrack PC's trail memory, so setting the distance between dots to a larger number will allow longer trails.

Creating a Map

Section6

All map files used by RavTrack PC will have an extension of ".maplib". For example, the default map is called worldmap2.maplib.

Raveon provides a tool for calibrating a graphic image, and turning it into a .maplib file. Along with the map image, you may also add your own custom icons. Icons are used to show the location of tracked objects on the map. RavTrack PC comes loaded with stock icons, but you may add your own using the ***Map Creation Tool***.

Executing MapManager

In the ***Tools*** menu, click on ***Map Creation Tool*** to create a new .maplib map or open an existing map. This will cause RavTrack PC to execute another program called *MapManager.exe*. *MapManager* is the program used to import maps, calibrate them and save them in the .maplib format. When *MapManager* creates a .maplib file, it contains the graphic image or the map, its calibration data, and any additional icons created for use in the specific map.

Import your map graphic into the MapManager tool, and follow the calibration instructions. The graphic file to be converted into a map is loaded by selecting ***Map, New Map…*** from the MapManager main window.

Once this selection is made, a calibration wizard will run, and ask a series of questions to assist with the map calibration.

Step 1 Selects the map datum. Select your country/region from the drop down list, and then choose the map datum you will use. In the USA, the most common map datum is WGS-84. The datum will be in Longitude/latitude.

Step 2, Choose the map projection. Most projections are Cartesian.

Step 3, 4, and 5 Require the user to click on known location on their image, and enter the latitude and longitude of these points. These three calibration points are used to calculate all other points on the map image. It is best to choose these three points on far sides of the map from each other.

You may also load icons into the .maplib map. Raveon has provided stock icons in the RavTrack PC program, and a large library of additional icon graphics can be found in the /icons subdirectory.

Save your calibrated .maplib file in the /maps subdirectory.

Icons

Icon images are stored together with the map in a .maplib file. When the user create a map, they also may load icons into the .maplib file for use with the map.

Supplies with RavTrack PC are standard icons stored in the file *StadardIcons.maplib*. This file is merged with the currently selected map

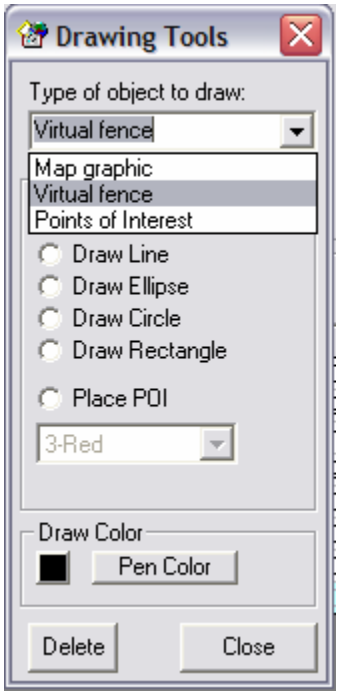
whenever the RavTrack PC begins. This merging of files is transparent to the user, and the end result is a larger list of icons to select from in *RavTrack PC*. When an icon is assigned to an object, a drop-down list of available icons is shown, and this list include the icon loaded in the current map's .maplib file along with all the icons from the *StadardIcons.maplib* file. The standard icons included with RavTrack PC always contain at least these icons:

1-red 	5-green 	Buggy 
2-red 	Bike-2 	Computer 
3-red 	Bus 	Quad 
4-green 	Car01 	Plane-red 
Blue-ball	Star-red 	Warning 
Red-ball 	Tree1 	ship 
plotdot 	default 	

The icon named ***plotdot*** has a special usage. Whenever a waypoint file is imported that has waypoint names associated with the waypoints, such as the Garmin .UPT format, the ***plotdot*** icon is used to show the location of the imported waypoint on the map.

The icon named ***default*** has a special usage. If the Auto-Add feature is enabled, and a position/status is reported from an object that is not in the database, it will automatically be added to the Tracked Objects database, and assigned the ***default*** icon.

Drawing Tools



To draw graphics on the map, or place points of interest (POIs), use the drawing tools built into RavTrack PC. Select Tools, Drawing Tools to bring up a small window that displays the drawing tools.

There are three primary uses of the drawing tools.

1. **Draw geo-fences for use in alerts and alarms.**
2. **Draw lines and graphics on the map.**
3. **Place points of interest (POIs) to show the location of specific places that may also be used in alerts and alarms.**

The layer on the map that the object is drawn on is very important. The Map Graphic layer is for graphics only, and any object placed on it is for visual purposes only. No point or object on the map Graphic layer can be used as a geo-fence or POI.

Circles, squares, and ellipses shapes placed on the Virtual Fence layer are given names when they are created. The shapes may be used for alerting and alarming when tracked objects move into or out of the area defined by the shape put on the Virtual Fence layer.

Points are specified on the map by placing an icon at the location using the Place POI function. If a POI icon is placed on the Points of Interest layer of the map, the POI may be used to trigger alerts and alarms. If it is placed on any other layer, it will not be used when checking for rule alerts.

Placing a simple graphic on the map

Select the layer ***Map Graphic*** from the pull-down menu.

Select the shape you wish to draw (line, Ellipse, Circle, Rectangle, POI Icon). When drawing a shape, the color of the pen may also be selected.

Click on the map, and draw the shape.

Creating an Electronic Fence (Geo-Fence)

Select the layer ***Virtual Fence*** from the pull-down menu.

Select the shape you wish to draw (Ellipse, Circle, or Rectangle). When drawing a shape, the color of the pen may also be selected.

Click on the map, and draw the shape.

When the shape is complete, RavTrack PC will prompt the operator to give the shape a name. This named shape may be used when creating alert rules related

to this fence. Fence names used in geo-fencing are not case sensitive. Carlsbad and CARLSABD will be treated as the same fence name.

Deleting a Graphic From the Map

To delete any POI, fence, or shape placed on the map, left-click on the graphic item. Its location and information will be displayed in the Object Info window.

Press the Del button to delete it. You must be logged into the program as Administrator to delete shapes, graphics, POIs, and fences.

The Log File

Section9

A log file is a database stored in the /data subdirectory that holds historical information about the location and status of the tracked objects. The file name is Rav*TrackActivity.mdb* and it is in *Microsoft Access* format.

Following is a list of the fields stored in the log file for each position/status reception from a tracked object.

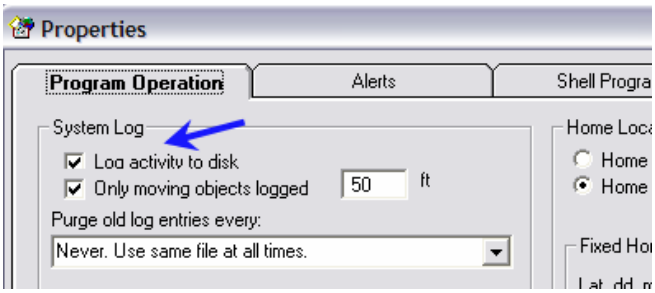
Field Name	Data Type	Description
EntryNum	AutoNumber	Sequential entry number in the log
ID	Number	Object ID number. 0000 - 9999
Status	Text	Status Code
Time	Date/Time	The time and date of the last updated position received from this object
Date	Date/Time	
Longitude	Text	The longitude of the last position received
Latitude	Text	The latitude of the last position received from this object
Alerts	Text	Warnings and alerts based upon Rules. BLANK = none.
Speed	Number	The object's estimated speed, based upon last two reported positions
Altitude	Number	The objects altitude
Direction	Number	The object's estimate direction, based upon the last two GPS reports
In1	Number	Input 1 status
In2	Number	Input 2 status
Satellites	Number	Number of satellites in view
UTCtime	Number	The UTC time received over the air
Voltage	Number	The device's DC voltage
Temperature	Number	Temperature of the device
RSSI	Number	Signal strength of the transmission
Spare1	Text	A spare data field
Comment	Text	Operator comment field

Enabling Logging of Activity

Logging RavTrack PC activity to the log file is a two-step process.

1. Enable the logging feature in RavTrack PC.
2. Enable logging for the individual tracked object

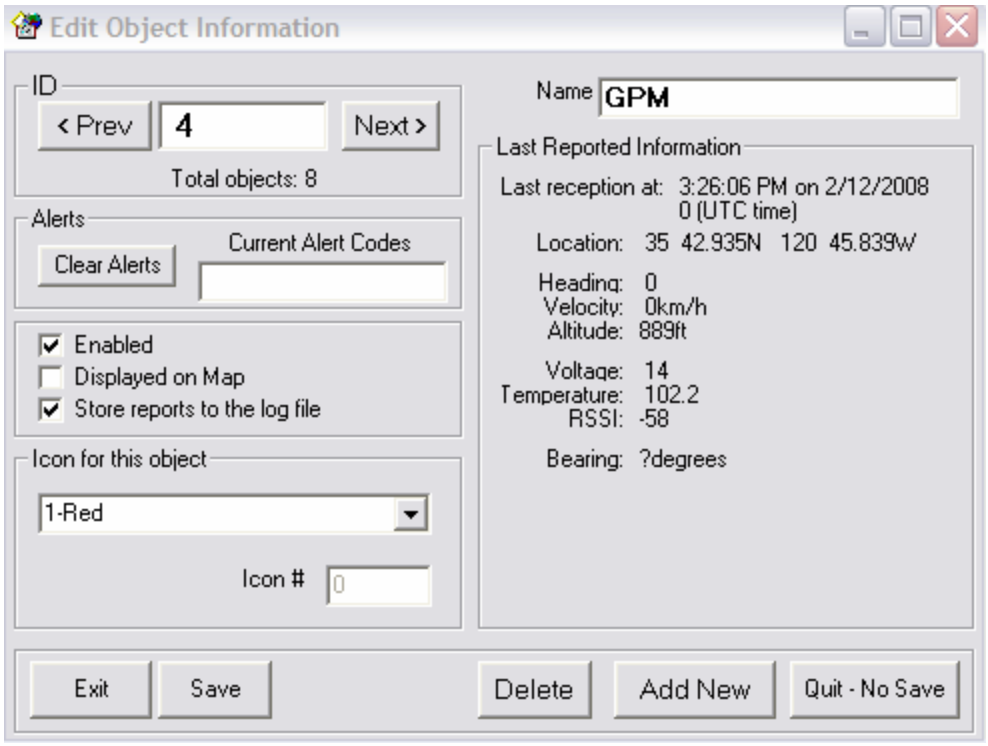
To enable RavTrack PC to store data in the log file, from the main screen, select ***File, Program Properties***. From the Properties screen, check ***Log activity to disk***. If you only wish to log objects that are moving, also check ***Only moving objects logged***, and specify the minimum distance an object must move before its location and status are stored to the log file.



Once logging is enabled, it still must be enabled for the individual tracked objects. Then a tracked object is first defined, the default logging is enabled.

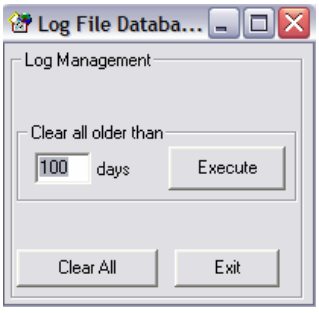
To enable/disable logging if individual objects, configure this by first double-clicking on the object in the database window, or select ***Tools, Add/edit tracked objects***.

Locate the object in question, and check ***Store reports to the log file*** to enable logging for this object. If checked, every time the object transmits a position/status, the specifics of the transmission are stored in the log file.



Log File Management

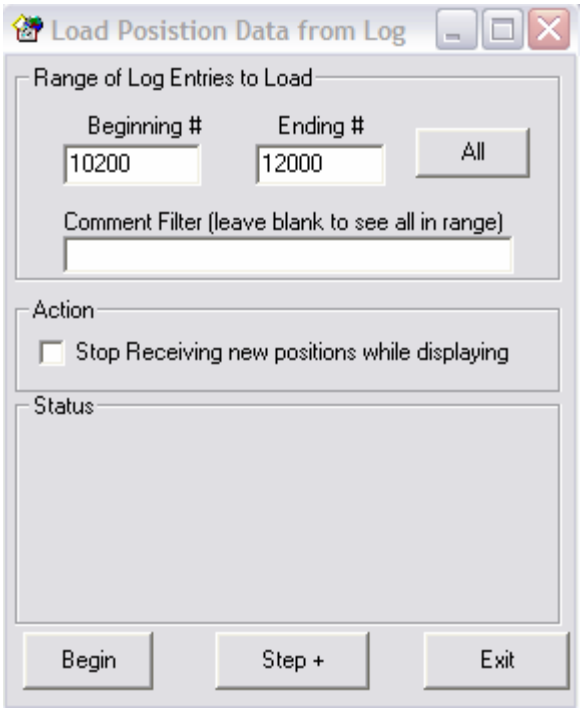
All log file entries are sequentially numbered. This facilitates management and reporting. To erase some or all of the log file, select ***File, Manage Log Database***.



Use this selection to erase old log entries. To erase all entries in the log file, select ***Clear All***.

Displaying Historical Data

To display the position/status of log file entries on the map, select ***Tools, Load Log File Entries to Map***. Enter the range of log-file entries you wish to display.



To load the whole log file to the map, select ***All***.

Each log entry has a comment stored with it. The comment that was stored with the entry was defined on the ***File, Program Properties*** window, in the box labeled ***Log File Entry Comments***.

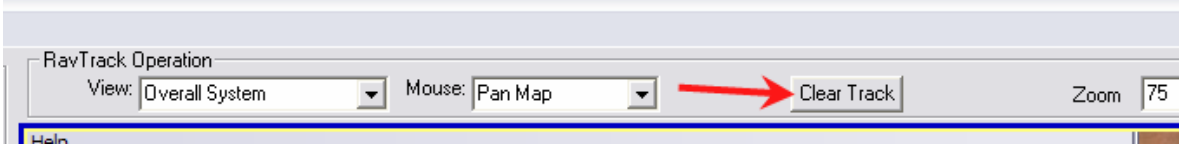
A powerful feature is the ability to only retrieve log entries with specific comments. To retrieve only the log entries which contain certain text in the comment field, enter the comment text to filter by in the ***Comment Filer*** text box.

Click on ***Begin*** to retrieve and display the log entries. Click on Step+ to load one entry at a time.

When a log entry is retrieved, the RavTrack PC program will put a dot on the map at the location of the log entry. Up to 5000 log entries may be displayed as dots on the map. If more than 5000 are recalled, then the last 5000 loaded will be displayed.

The log file dots on the map are linked to the log file, so the user may right-click on a dot, and the RavTrack PC program will display the location and status information in the ***Object Info:*** window that was stored with that particular log entry.

Whenever log file dots are displayed on the map, a ***Clear Track*** button will appear on the top of the main window. Click this button to erase the log entries from the map.



RavTrack Event Log

If Activity logging is enabled, movement and status of tracked objects are stored in the Rav*TrackActivity.mdb* file. Additionally, a text file is created and various system activities related to the *RavTrack PC* operation and its actions are recorded in it. The system log file is called RT-w-yyyy.txt where w is the current week number, and yyyy is the current year. Every week a new file is created.

The RT- system log files are stored in a subdirectory under the main RavTrack PC directory. The subdirectory is \RavTrack\logfiles\.

Any text viewing program may be used to review the system log file.

Alerts and Alarms

Section10

Alerts are triggered events caused by tracked objects meeting (or violating) pre-set rules. RavTrack PC has provisions to trigger alerts based upon:

Electronics Fences (Geo-fences)

Inside the fence
Outside the fence

Parameters

Idle Time
Speed
Voltage

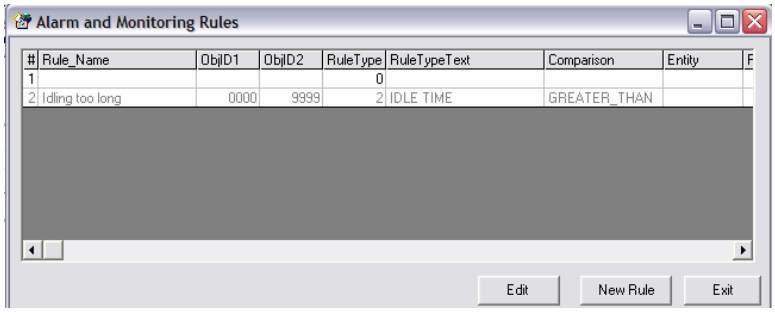
Distance

Distance from home
Distance from an object
Distance from a Point of Interest

Setting up an Alert

To configure an alert, select ***Tools, Alarms and Rules***.

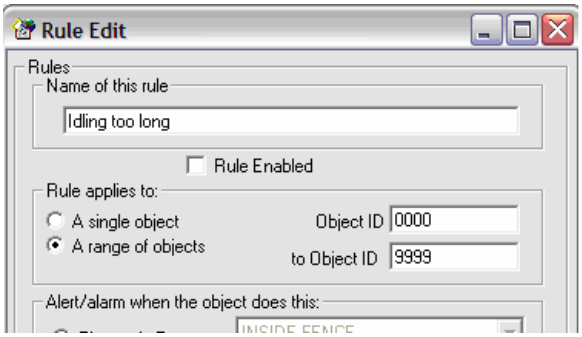
This will bring up a small window with a list of all of the current alerts configured in the system. Each alert is given a rule name by the user who created the alert.



To create a new rule, click the ***New Rule*** button. To edit an existing rule, double-click the rule in the list or select it, and click ***Edit***.

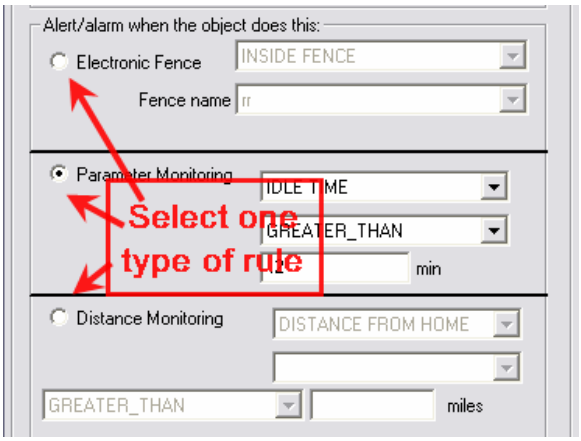
Enter the name for the rule in the ***Name of this rule*** text box. The name of the rule will appear in an alert box if the rule is triggered, and the operator of the program needs to be notified.

Use a name for the rule that the operator will understand. For example, instead of calling a rule "*Rule A*", call it "*Speeding Rule – Object is exceeding the preset speed limit.* " This will allow the operator to better understand the situation that triggered the rule.



In the ***Rule Applies To box***, select the range of object IDs that this rule will apply to. Every time an object reports its position and status, the *RavTrack PC*'s rule processor checks the position and status against all rules that apply to the object. A rule will apply only if the reporting object's ID is within the ID range specified in this box.

There are three basic types of rules, and the user must select which one to perform. Under these three basic types, are a variety of variations. If more than one type of rule should apply to a tracked object, create another rule for each additional rule type desired. The rule types are:



Electronics Fences (Geo-fences)
- *Inside the Fence*
- *Outside the Fence*

Parameter Monitoring
- *Speed*
- *Voltage*
- *Idle Time (not moving)*
- *Missing (No position reports received)*

Distance Monitoring
- *Distance from a POI*
- *Distance from Home*

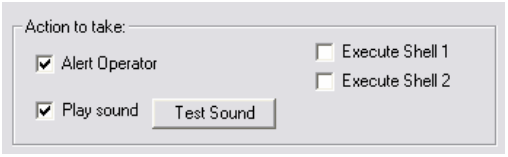
Once the rule type is selected, select the appropriate logic for the rule, and any required parameters.

For electronic fences, a fence must first be draw on the "Fences" layer of the map, and given a name. Then a geo-fence rule may be created for the named fence.

Note, if two fences on the map have the same name, a rule alert may not be triggered even if the tracked object is inside or outside of either fence. Do not use the same name for two different fences.

Actions

When a rule that is configured is meet, a variety of actions may be taken. The possible actions are:



The sound files to play and the shell programs to execute are configured in the ***File, Program Properties, Alerts*** menu and the ***File, Program Properties, Shells*** selections.

To have an object that triggers an alert be highlighted in red in the tracked objects window, select ***File, Program Properties, Alerts,*** and check the ***Highlight object in RED when it triggers a rule alert*** box.

Alert Initialization

When an alert is triggered, the rule triggering event is stored in the racked object's database record so that continued triggering of the rule do not continue to re-trigger alert actions.

When the rule ceases to be triggered, the rule event is removed from the object's record in the tracked objects database.

When the *RavTrack PC* software is first started up, it optionally may erase the alert triggers stored in the tracked objects database. This ensures that any object triggering a rule will again trigger it and execute the configured action. To have RavTrack PC clear the alert memory upon start-up of the program, select ***File, Program Properties, Alerts,*** and check the ***Clear Rule Alerts for individual objects upon program start*** checkbox.

Revision History

Version 1.1.2 February 7, 2008

Initial Beta release of the firmware
Activation code is 1R3A5-129RT

Version 1.2.0 February 17, 2008

Temporary Beta release of the firmware
Activation code is 1R3A5-129RT
Improve alert configuration and operation
Improved admin login-logout. Recalls settings upon restart

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